

County of Loudoun
Department of Planning
MEMORANDUM

DATE: July 2, 2009

TO: Judi Birkitt, Project Manager
Land Use Review

FROM: Joe Gorney, AICP, Senior Planner JCG
Community Planning

**SUBJECT: SPEX 2009-0009 & CMPT 2009-0001,
Hybrid Energy Park at Stonewall Secure Business Park**

BACKGROUND

Stonewall Creek LLC requests a Special Exception and a Commission Permit to allow a utility generating plant and transmission facility on approximately 87 acres in the PD-GI (Planned Development – General Industry) portion of the proposed Stonewall Secure Business Park (ZMAP 2008-0017, et alia). The primary and peak demand facility is to include up to a 600 megawatt combined cycle gas turbine-wastewater energy plant, up to two 150 megawatt simple cycle peaking power natural gas turbines, and a 1 megawatt solar array, for a total of 901 megawatts.

The two natural gas turbines would combust natural gas to produce electricity as the first cycle of the combined-cycle process. The exhaust heat from the process is then mixed with water to produce steam, which in turn is used to run additional turbines to produce electricity. Excess steam and cooling produced by the plant is also proposed to heat and cool data centers and other buildings within the Stonewall Secure Business Park. The applicant states that the Hybrid Energy Park will also provide Loudoun County with tax revenues and “green” energy to help attract and support an industry cluster of high security governmental and business uses in Loudoun County.

The property contains two natural gas transmission lines and two overhead electrical transmission lines. The applicant proposes a connection to these utilities and the use of 5 million gallons of wastewater effluent per day from the Leesburg Wastewater Treatment Plant for use in the energy plant. The applicant states that the use of the effluent could eliminate two billion gallons of effluent from being discharged into the

Potomac River each year from the Leesburg Wastewater Treatment Plant. The use of the effluent would necessitate the construction of two wastewater lines and pumping equipment between the utility plant and the Wastewater Treatment Plant. The applicant has not provided information regarding possible alignments for these wastewater lines.

The applicant states that the combined cycle turbines, peak generating turbines, and solar array will provide a dedicated and reliable source of power to help satisfy demand for new electrical power generation. The Energy Park is also intended to supply the associated Stonewall Secure Business Park (ZMAP 2008-0017, et alia) with redundant, efficient, and reliable energy for high-tech and data center uses.

The subject property consists of seven parcels or portions of parcels that are generally bounded to the north by Sycolin Creek, to the east by vacant land, to the south by the Dulles Greenway (Route 267) and to the west by Sycolin Road (Route 643) (see Vicinity Map). The site is currently vacant. Existing and planned developments surrounding the site include the Philip Bolen Park to the north, vacant land to the east, the Dulles Greenway to the south, several residences to the west, and a church to the northwest. The Town of Leesburg's Joint Land Management Area is located on the north side of the subject property. The Goose Creek Reservoir, Goose Creek, and a water intake owned by the City of Fairfax are located approximately 1,500 feet to the east of the proposed plant.

Staff notes that applications have been received from Luck Stone Corporation and Loudoun Water regarding a proposed expansion of quarry operations and the construction of a water treatment facility on the vacant land to the east of the Stonewall site (ZMAP 2009-0003, Luck Stone Quarry and ZMAP 2009-0004, Loudoun Water and Luck Stone Quarry).

The subject property contains significant environmental features, including river and stream corridor resources, wetlands, forest resources, steep and moderately steep slopes, diabase, plant and wildlife habitats, and historic and archaeological resources. A Scenic Creek Valley Buffer extends 150 feet from the channel scar line of Sycolin Creek onto the property. The Quarry Notification Overlay District exists on-site and the property is generally located within the Ldn 60 noise contour 1-mile buffer of the Leesburg Executive Airport. In addition, rights-of-way for two underground natural gas transmission lines and overhead electrical transmission lines bisect the site in a north-south direction.

COMPLIANCE WITH THE COMPREHENSIVE PLAN

The subject site is governed under the policies outlined in the Revised General Plan, the Revised Countywide Transportation Plan (CTP), and the Toll Road Plan (TRP).

Being newer than the TRP, the Revised General Plan supersedes the TRP when there is a policy conflict between the two (Revised General Plan, Chapter 1, Relationship to Other County Planning Documents, text). The policies of the Bicycle and Pedestrian Mobility Master Plan (Bike/Ped Plan) also apply.

The subject properties are principally located within the Transition Policy Area with approximately 2.3 acres within the Leesburg Joint Land Management Area (JLMA) (Revised General Plan, Chapter 7, Planned Land Use Map; Chapter 9, Leesburg & JLMA Map).

Specifically, the non-residential policies of Chapters 8 (Transition Policy Area) and 11 (Implementation) of the Revised General Plan apply to the proposed development including open spaces, stormwater management, quarry compatibility, streetscape and land use arrangement, building scale and form, noise impacts, and lighting and signage. The infrastructure policies of Chapter 2 (Planning Approach) also apply including energy and communication facilities.

The environmental features on the subject site were assessed applying the Green Infrastructure policies of Chapter 5 (The Green Infrastructure: Environmental, Natural, and Heritage Resources) of the Revised General Plan, including policies pertaining to river and stream corridor resources, wetlands, forest resources, steep and moderately steep slopes, diabase, plant and wildlife habitats, and historic resources.

ANALYSIS

LAND USE

The County's vision for the Transition Policy Area is for land uses that provide a visual and spatial transition between the suburban development in the east and rural development in the west (Revised General Plan, Chapter 8, General Policies, General Policy 2). Developments within the Transition Policy Area will fully integrate the elements of the Green Infrastructure and establish natural open spaces as a predominant visual element and enhancement to the area's river and stream corridors (Revised General Plan, Chapter 8, General Policies, General Policy 2).

With the exception of approximately 2.3 acres within the Leesburg JLMA, the subject property is located within the Lower Sycolin subarea, which the Plan envisions to have a more rural character with lower densities and greater open space requirements than other subareas in order to protect the drinking water resources of the Occoquan, Beaverdam, and Goose Creek Reservoirs and to facilitate a transition to the Rural Policy Area (Revised General Plan, Chapter 8, Transition Policy Area Subareas Map; Lower Sycolin and Middle Goose Subareas, text; and, General Policies, General Policy 1). Open spaces will be the dominant visual feature of sites within the Lower

Sycolin subarea (*Revised General Plan, Chapter 8, Lower Sycolin and Middle Goose Subareas, text*). The County envisions that the Lower Sycolin subarea will have a base residential density of 1 dwelling per 10 acres in a clustered pattern, with the option to rezone to a density of 1 dwelling per 3 acres in a Rural Village (*Revised General Plan, Chapter 8, Lower Sycolin and Middle Goose Subareas, text*). Development will maintain a minimum of 70 percent of a site as open space (*Revised General Plan, Chapter 8, Community Design Policies, Community Design Policy 2*). Central and communal water and wastewater systems are preferred over individual utility systems in this portion of the Lower Sycolin subarea (*Revised General Plan, Chapter 8, Lower Sycolin and Middle Goose Subareas, text*). Additionally, the County will protect the Luck Stone Quarry in the Lower Sycolin subarea from incompatible uses by ensuring that encroaching new development does not hinder the quarry operations (*Revised General Plan, Chapter 8, Community Design Policies, Community Design Policy 26*).

The County encourages the development of non-residential uses in the Transition Policy Area that provide a transition from suburban to rural. Such uses may include, but are not limited to, equestrian centers, golf courses, retail nurseries, boarding schools and kennels, and large institutions, provided they meet specific criteria that address the nature, scale, and intensity of the use, market area, and design characteristics (*Revised General Plan, Chapter 8, Community Design Policies, Community Design Policy 15*). Institutional uses include government offices and facilities; and public or private health, recreational, or educational uses and facilities such as schools, training centers, universities, libraries, hospitals, camps, congregate care facilities, or similar facilities (*Revised General Plan, Glossary, Institutional Uses, definition*). Institutional uses will be compatible with the policies of the Transition Policy Area and serve to promote a rural character while serving both the rural and suburban populations (*Revised General Plan, Chapter 8, Land Use Pattern, text*). Non-residential uses will serve to define the Transition Policy Area as a unique planning area. The County will allow for a range of uses that are compatible with desired development patterns and the rural landscape and are at intensities not permitted within the Rural Policy Area (*Revised General Plan, Chapter 8, Community Design Policies, Community Design Policy 16*).

Consistency Between Applications

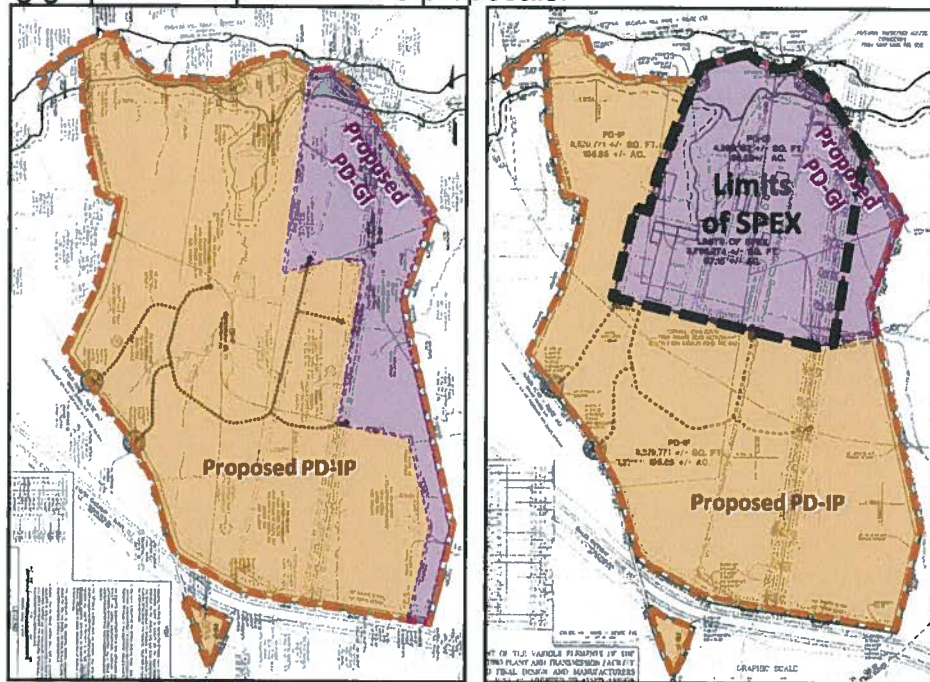
Staff notes the proposed Hybrid Energy Park comprises approximately 87.2 acres of the larger 291.5-acre Stonewall Secure Business Park (ZMAP 2008-0017, et alia). The Stonewall Secure Business Park application includes a Rezoning Amendment (ZMAP 2008-0017) and three Special Exceptions (SPEX 2008-0068, SPEX 2008-0069, & SPEX 2008-0070) to allow 6.81 million square feet of high-security office and industrial uses. The current application does not address the relationship of the two applications. A review of the Rezoning Amendment and Special Exceptions was sent under separate cover on May 21, 2009.

Staff notes that the two applications contain inconsistencies regarding the proposed zoning boundaries and the acreages of those zoning categories:

	Stonewall Secure Business Park (ZMAP 2008-0017)	Hybrid Energy Park (SPEX 2009-0009)
PD-GI	62.5	98.7
PD-IP	231.8	195.6
Total	294.3	294.3
SPEX Area	87.2	not included

Comparison of Stonewall Applications

The following graphics compare the two proposals.



**Stonewall Secure Business Park
(ZMAP 2008-0017)**

**Hybrid Energy Park
(SPEX 2009-0009)**

The differences between the applications notwithstanding, while staff understands that the special exception and rezoning applications are separate, the proposed land uses are related. Currently, the relationship of the two proposals is unclear. Additional information is necessary to determine whether the uses will be integrated, to determine whether environmental resources will be adequately protected, and to assess the full transportation impacts of the two proposals.

Energy and Communication Facilities

The County supports the timely delivery of electrical service to businesses and households as development occurs, but seeks to minimize the negative visual impacts through regulations. Additionally, the County intends to develop policies for capital-intensive technology industries that are flexible enough to meet the needs of the industry but are effective in preventing harmful environmental impacts on the community (*Revised General Plan, Chapter 2, Energy and Communication Facilities, text*). Electric generation facilities that use clean burning and environmentally sound and proven fuel sources for power generation can be located only where their impact on the surrounding land uses and the environment is compatible (*Revised General Plan, Chapter 2, Energy and Communication Policies, Energy and Communication Policy 4*). The County anticipates the development and implementation of a comprehensive utilities plan to address the impacts and location requirements of energy and communications facilities (*Revised General Plan, Chapter 2, Energy and Communication Policies, Energy and Communication Policy 6*). Areas disturbed by any public utility expansions should be planted and/or reforested and screened from adjacent uses (*Revised General Plan, Chapter 2, Energy and Communication Policies, Energy and Communication Policy 2*).

The applicant also stated that the site contains the resources necessary for a utility plant, including two interstate natural gas transmission lines and three 230kV Dominion Virginia transmission circuits on two separate aerial structure lines (*Statement of Justification, March 25, 2009, p. 4*). It is unclear what portion of the electricity to be generated on-site would be used by the Stonewall Secure Business Park and what portion would be routed to the local electrical grid.

The applicant has provided a plan view depicting possible locations for the utility plant facilities. These facilities would cover approximately 33 acres (approximately 38 percent) of the 87-acre Special Exception Area. Residential uses lie approximately 450 feet to the west of the proposed Special Exception Area and power plant turbines. The applicant did not provide elevations or heights of the facilities.

The County anticipates that a visual and spatial transition could be achieved through an appropriate scale, intensity of use, and design characteristics, including both site design and building design, between the Suburban Policy Area to the east and the Rural Policy Area to the west. With the information provided, it is unclear how elements of the Green Infrastructure will be integrated into the development, whether natural open spaces will be developed as a predominant visual element and enhancement to the area's river and stream corridors, or how the development would be compatible with the low-density residential development existing or planned in the remainder of the subarea.

Given the nature and scale of the proposed use, the proximity of residential uses 450 feet to the west, the proximity of the Leesburg Executive Airport, and the presence of sensitive environmental features, more information is necessary to discern the impact

of the utility plant. Although the general location of the power plant facilities have been depicted in plan view on the plat, no information has been given regarding the disposition of the areas outside the power plant footprint. While the areas outside the power plant footprint are covered under the Stonewall Secure Business Park application (ZMAP 2008-0017, et alia), that application does not offer site-specific development information.

Currently, this application and Stonewall Secure Business Park (ZMAP 2008-0017, et alia) are being considered separately. Given that the two applications have been submitted separately, the current application will generally be evaluated as a stand-alone application. However, it is staff's understanding that uses within the proposed Stonewall Secure Business Park may be reliant on energy produced from the proposed power plant. It is unclear whether the Business Park will be viable without the power plant. Additionally, the combined impact of the two applications is unclear. Consideration of the power plant impacts without consideration of the Business Park impacts may not allow elements of the Green Infrastructure, open space, or compatibility to be adequately addressed. (See the Green Infrastructure section for a more extensive discussion of the elements of the Green Infrastructure).

Staff recommends the applicant combine the Hybrid Energy Park and Stonewall Secure Business Park applications to ensure that the layout and design of the two are consistent with Plan policies, to adequately assess all the environmental on-site resources, to determine areas most suitable for development, to assess transportation impacts, and to ensure that the necessary infrastructure will be available to serve the proposed uses. The applicant should specify the number of employees, the amount of truck traffic, and compatibility measures between the proposed use and the nearby residential uses, and explain the impacts of the generated traffic to the surrounding roadway network.

Staff recommends that the applicant provide further information regarding the visual and physical impacts of the utility plant on site resources, nearby residential uses, and the Leesburg Executive Airport. Staff requests information regarding the relationship of the proposed facilities to these uses, along with anticipated compatibility and mitigation measures, such as reforestation, screening, and water protection. Staff also recommends that the applicant provide information regarding the two wastewater lines and pumping equipment between the power plant and the Leesburg Wastewater Treatment Plant.

Staff requests that the applicant provide enough information to effectively assess the proposal, including information regarding any internal resource protection areas or resource protection measures. The applicant should also explain and demonstrate how elements of the Green Infrastructure will be integrated into the

development, how natural open spaces will be developed as a predominant visual element and enhancement to the area's river and stream corridors, and how the development will be compatible with the low-density residential development existing or planned in the remainder of the subarea. With consideration of elements of the Green Infrastructure, open space, and the proximity of neighboring residential uses, the applicant should demonstrate how the application will effect a visual and spatial transition between the Suburban Policy Area and the Rural Policy Area and demonstrate how and why the proposal is appropriate for the Lower Sycolin subarea of the Transition Policy Area.

The applicant should also provide information regarding alternative locations and configurations that may have been considered, both within the limits of the proposed Special Exception and the larger Stonewall Business Park.

GREEN INFRASTRUCTURE

The Green Infrastructure is a collection of natural, cultural, heritage, environmental, protected, passive, and active resources that are integrated into a related system. These resources include wetlands, steep and moderately steep slopes, and vegetated landscapes (Revised General Plan, Chapter 5, Green Infrastructure Policies, Green Infrastructure Policy 1). The County uses integrated management strategies for the Green Infrastructure to ensure that all land use planning and development respect and preserve the holistic nature of the elements of the Green Infrastructure (Revised General Plan, Chapter 5, Green Infrastructure Policies, Green Infrastructure Policy 2). The Plan calls for all development within the Transition Policy Area to be clustered, provide ample open space, and fully implement the Green Infrastructure policies (Revised General Plan, Chapter 8, Land Use Pattern, text).



Vicinity Map

The subject site contains significant Green Infrastructure resources including river and stream corridors, floodplains, wetlands, riparian vegetation, perennial and intermittent streams, natural drainageways, forest resources, steep and moderately steep slopes, plant and wildlife habitats, historic and archaeological resources, diabase soils, and hydric soils. A Scenic Creek Valley Buffer extends 150 feet from the

channel scar line of Sycolin Creek onto the property. The site is also impacted by the Ldn 60-65 and Ldn 60 1-mile buffer of the Airport Impact Overlay District associated with the Leesburg Executive Airport and the Quarry Notification Overlay District associated with the Luck Stone Quarry. Green Infrastructure elements are discussed below.

Air Quality

Loudoun County's air quality is threatened by air pollution from automobile and aircraft emissions, heating furnaces, and power plants. More efficient and better planned transportation and pedestrian networks, tree preservation and planting, reforestation and preservation of natural landscapes will help minimize the threat to the County's air quality. In order to meet the federal goals of the Clean Air Act, the County offers an integrated land use approach that protects air quality by planning development in locations that are close to major transportation facilities and transit nodes and promoting and implementing alternative modes of transportation (*Revised General Plan, Chapter 5, Air Quality, text*).

The County will develop land use and transportation policies and measures that tend to reduce single occupancy vehicle trips, vehicle miles traveled, and associated emissions in order to improve air quality. Such measures will support the creation of pedestrian and bicycle facilities, park-and-ride lots, and mass transit options (*Revised General Plan, Chapter 5, Air Quality Policies, Air Quality Policy 1*). The County will promote tree planting and preservation as a means to improve air quality (*Revised General Plan, Chapter 5, Air Quality Policies, Air Quality Policy 2*). The County will comply with the requirements of the federal Clean Air Act Amendments of 1990 through support of the State Implementation Plan (SIP) (*Revised General Plan, Chapter 5, Air Quality Policies, Air Quality Policy 4*). Loudoun County acknowledges its location in the Washington, DC-MD-VA Nonattainment Area. The County will play an active role on the Metropolitan Washington Air Quality Committee (MWAQC) and the National Capital Region Transportation Planning Board (TPB) and will do its part in the implementation of the Phase II Attainment Plan for the Washington Metropolitan Nonattainment Area, as well as future emissions reduction programs (*Revised General Plan, Chapter 5, Air Quality Policies, Air Quality Policy 5*).

The applicant states that the proposed Hybrid Energy Park will be required to comply with the requirements of the Clean Air Act Amendments of 1990¹. The applicant also states that natural gas, which would be combusted in the power plant, has 63 percent of the carbon content of coal and 80 percent of the carbon content of petroleum. The natural gas would be drawn from underground gas lines, which run across the site,

¹ Supplemental Information regarding air quality is provided in Attachment 1.

precluding the use of tanker trucks and their associated pollution. The applicant states that the proposed power plant may qualify for credits that would enable the closure of a coal-fired power plant within a Power Service Area. The boundaries of the referenced Power Service Area have not been defined and it is unclear which facilities might be considered for closure. The applicant also states that local approval of the proposed special exception and commission permit are the first steps in a longer process, which involve federal and State approvals (*Statement of Justification, March 25, 2009, p.7*).

Given the nature of the application and its relationship to the Clear Air Act, the SIP, and the utilization of wastewater effluent from the Leesburg Wastewater Treatment Plant, the applicant will need to coordinate with the Virginia Department of Environmental Quality (DEQ), the Metropolitan Washington Council of Governments (MWCOG), and the Town of Leesburg. The applicant has not provided details regarding coordination with these entities or with the owners of the natural gas transmission lines and the electrical transmission lines.

Additionally, the impact of the power plant on the surrounding uses and the region is unclear. To discern the nature of the proposal and effectively evaluate it for conformance with the Plan, staff would expect the applicant to provide information regarding plant operations, compliance with the requirements of the federal Clean Air Act and its Amendments, the State Implementation Plan (SIP), and regional Attainment plans, and other measures to improve air quality, such as tree planting and preservation.

Staff recommends that the applicant coordinate with the staff of the Virginia Department of Environmental Quality (DEQ) at the Northern Virginia Regional Office and the Metropolitan Washington Council of Governments (MWCOG) regarding compliance with the requirements of the Clean Air Act Amendments, the State Implementation Plan, and the air permit review process. The applicant should explain the timing and the relationship of the land use applications to federal and State permits.

The applicant should address air quality impacts of the plant, both local and regional, and provide information regarding plant operations, compliance with the requirements of the federal Clean Air Act and its Amendments, the State Implementation Plan (SIP), and regional Attainment plans, and other measures to improve air quality, such as tree planting and preservation.

Because the proposed power plant would also be dependant upon its interface with natural gas supplies, electrical power transmission facilities, and treated wastewater, the applicant should also provide information regarding the nature of those interfaces and the status of coordination with the owners of those facilities.

Staff recommends that any use be conditioned on the approval of the applicable State and federal permits.

The applicant should also specify the expected number of employees for the power plant and provide details regarding the expected plant operating schedule. The applicant should profile any measures being proposed to reduce single occupancy vehicle trips, vehicle miles traveled, and associated emissions in order to improve air quality, such as the creation of pedestrian and bicycle facilities, park-and-ride lots, and mass transit options.

River & Stream Corridor Resources

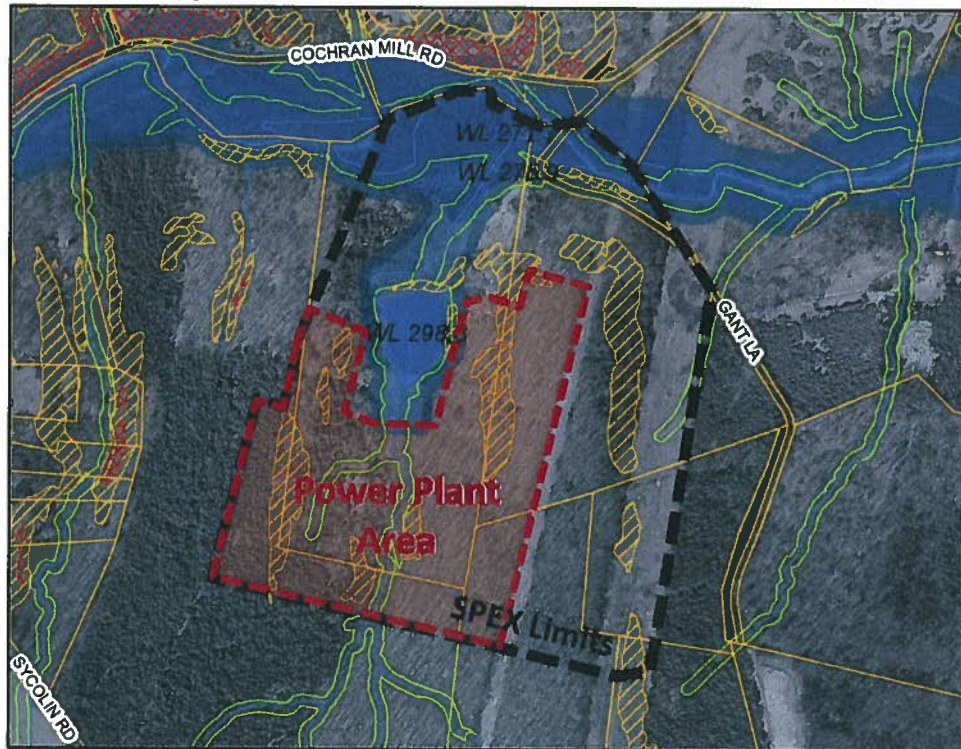
River and stream corridor resources are significant elements of the Green Infrastructure. Developments within the Transition Policy Area will fully integrate these elements (Revised General Plan, Chapter 8, General Policies, General Policy 2). Additionally, the County Comprehensive Plan limits development potential within the Lower Sycolin subarea in order to protect the drinking water resources of the reservoirs (Revised General Plan, Chapter 8, General Policies, General Policy 1). The Plan calls for a 50-foot management buffer surrounding 100-year floodplains and adjacent steep slopes in order to protect the stream corridor from upland disturbance and adjacent development. Steep slopes extending up to 100 feet beyond the originating stream or floodplain shall be included (Revised General Plan, Chapter 5, River and Stream Corridor Resources Policies, River and Stream Corridor Resources Policy 2). The Comprehensive Plan permits a limited number of uses in the stream corridor, including passive and active recreation, road crossings, pervious paths and trails, and agricultural activities (Revised General Plan, Chapter 5, River and Stream Corridor Resources Policies, River and Stream Corridor Resources Policy 18).

The Revised General Plan calls for the establishment of strict performance standards and best management practice requirements within County ordinances and regulations for Scenic Creek Valley Buffers (SCVB) to address and satisfy the ecosystem, water quality, flood protection, habitat, and use objectives of the River and Stream Corridor Resources policies. Performance standards and criteria will ensure the health and biological integrity of the river and stream corridors and minimize adverse impacts. Requiring best management practices for the activities permitted within the river and stream corridors will help to protect and conserve natural resources and their processes, and ensure both economic and ecological success (Revised General Plan, Chapter 5, River and Stream Corridor Resources Policies, River and Stream Corridor Resources Policy 16). The SCVB is further defined by Section 5-1000 of the Zoning Ordinance and applies to areas adjacent to scenic rivers and all waterways draining more than 640 acres by providing a setback area from the channel scar line. It was created in part to promote water quality and the preservation of significant

environmental resource areas, wildlife habitat and corridors, and native vegetation areas and to implement the Comprehensive Plan (Revised 1993 Zoning Ordinance, Section 5-1001).

The subject property is located within the Goose Creek Watershed and contains significant river and stream resources associated with Sycolin Creek. Sycolin Creek is a tributary of Goose Creek, which in turn flows into the Potomac River. Goose Creek is impounded east of the subject property, forming the Goose Creek Reservoir. The subject property lies approximately 1,500 feet from the Goose Creek Reservoir.

The applicant has depicted the limits of a 50-foot River and Stream Corridor Resource Management Buffer on the plat but has not described the uses to be permitted in the area. Although a 150-foot SCVB exists along Sycolin Creek, its limits have not been annotated on the plat. The relationship of the SCVB to the 50-foot River and Stream Management Buffer is unclear. Additionally, the proposal appears to impact portions of the 50-foot Management Buffer, although the plat does not address impacts to these resources or anticipated mitigation measures. Additionally, two wastewater lines would need to be constructed in easements connecting the Leesburg Wastewater Treatment Plant with the site. No information has been provided regarding the possible alignment of these lines or their expected impacts to local waterways and other Green Infrastructure resources.



Proposed Special Exception Limits and Power Plant Area

Given the importance of the site's stream corridors, the intensity of the proposed development, and in order to protect the site's stream corridors and drinking water resources, staff recommends that the 50-foot Management Buffer be provided along the Sycolin Creek floodplain and the adjacent steep slopes and that the applicant limit uses in the corridor to those specified in County policies. Adjacent steep slopes extending up to 100 feet beyond the originating stream or floodplain should also be buffered.

Additionally, staff recommends that the applicant depict the 150-foot Scenic Creek Valley Buffer on the plat so that the extent of the Buffer and its relationship to the 50-foot River and Stream Corridor Management Buffer can be assessed. Uses within the SCVB should be limited to those defined in the Revised 1993 Zoning Ordinance.

The applicant should also address anticipated impacts to local waterways from the construction of two wastewater lines and pumping facilities between the power plant and the Leesburg Wastewater Treatment Plant.

Wetlands

The County supports the federal goal of no net loss to wetlands (Revised General Plan, Chapter 5, River and Stream Corridor Resources Policies, River and Stream Corridor Resources Policy 23). Plan policies call for the County to work with the U.S. Army Corps of Engineers regional office to regulate wetlands outside of river and stream corridors (Revised General Plan, Chapter 5, River and Stream Corridor Resources Policies, River and Stream Corridor Resources Policy 13). In the event of an impact, compensatory mitigation (restoration, creation, enhancement, and preservation) could replace the loss of wetland functions in the watershed to meet the County's goal of no net loss to the existing acreage and functions of wetlands.

The County predictive wetlands model and the applicant's plat depict wetlands and drainages throughout the site. Several wetlands are hydrologically connected to Sycolin Creek and would be impacted by the proposed use. The plat does not address impacts to these resources or anticipated mitigation measures.

Staff recommends that the applicant avoid impacts to wetlands and natural drainages and design the project so that the functionality of these features are preserved. Staff recommends that the applicant pay special attention to wetlands and drainages hydrologically connected to Sycolin Creek to help ensure the preservation of the Creek corridor, wildlife habitat, and native vegetation and promote water quality and flood control. Furthermore, degraded wetlands should be restored if those sites are of significant merit. If impacts to wetlands are

unavoidable, staff recommends on-site mitigation. Areas near Sycolin Creek may provide areas suitable for wetlands mitigation. Staff recommends that the applicant investigate the potential for these on-site areas to function as wetlands mitigation sites. If on-site mitigation is not possible, staff recommends mitigation within the same watershed and, if mitigation is not possible within the same watershed, within other parts of Loudoun County.

Forest Resources

The subject property is heavily forested. The Revised General Plan calls for the protection of forests and natural vegetation for the various economic and environmental benefits that they provide (Revised General Plan, Chapter 5, Forest, Trees, and Vegetation Policies, Forests, Trees, and Vegetation Policy 1). Plan policies also call for the submittal and approval of a tree conservation or forest management plan prior to any land development that “demonstrates a management strategy that ensures the long-term sustainability of any designated tree save area” (Revised General Plan, Chapter 5, Forest, Trees, and Vegetation Policies, Forests, Trees, and Vegetation Policy 3). Forests and indigenous vegetation will be preserved on steep slopes (greater than 25 percent). On moderately steep slopes (15 to 25 percent grade) clearing will be limited to only essential clearing necessary for home construction, road construction, and utility construction. Silviculture activities may be allowed on moderately steep slopes provided that an approved Forest Management Plan is implemented (Revised General Plan, Chapter 5, Forest, Trees, and Vegetation Policies, Forests, Trees, and Vegetation Policy 2).



**Gas Line Easement
April 8, 2009**

The related rezoning application for the Stonewall Secure Business Park (ZMAP 2008-0017, et alia) includes a Forest Management Plan and Cover Type Map prepared by Zimar & Associates, Inc. that describes the species, quality, age, and location of the existing vegetation. Six cover types were identified on the subject property. The highest quality forest cover (Cover Type 1) consists primarily of upland hardwoods and is located along either side of the transmission line easement with another area south of the Sycolin Creek corridor. The

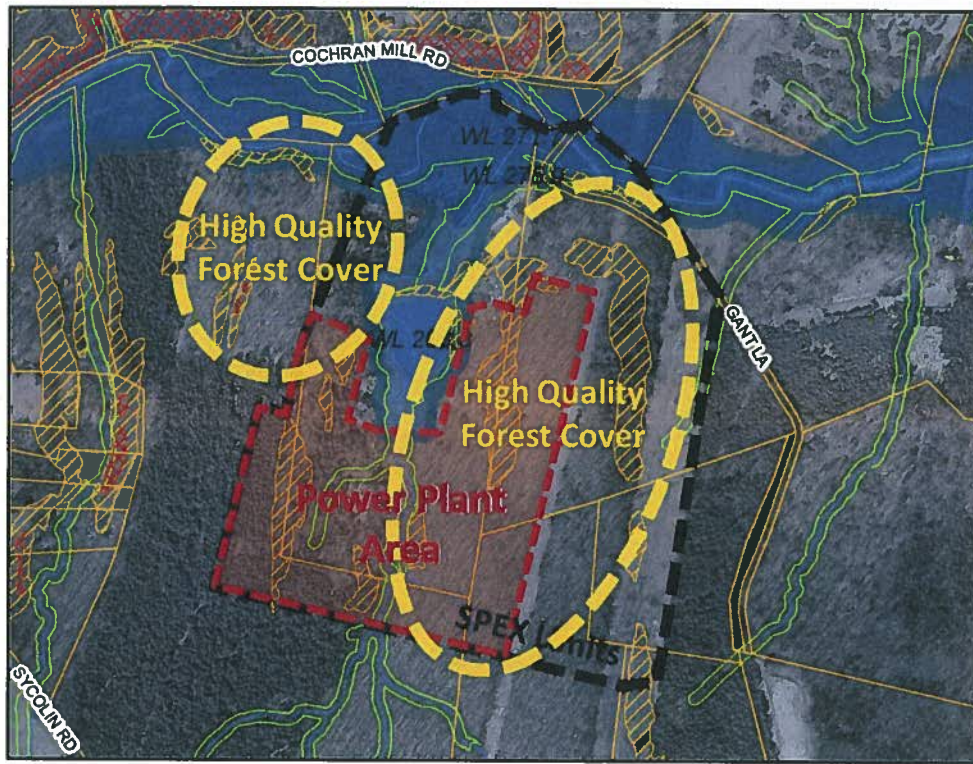
Forest Management Recommendations from applicant's Forest Management Plan state that “[t]his Cover Type is of the highest priority for forest management and preservation considerations due to the quality and size class of the trees it contains. Portions of this cover type may be considered for preservation during the development planning

process" (*Forest Management Plan and Cover Type Map, Cover Type 1 text, p. 10*). Another high quality Cover Type is Cover Type 2 (bottomland hardwoods), which is located primarily within the Sycolin Creek floodplain and southeast of the site's largest pond. The Forest Management Plan states that Cover Type 2 is "a high priority for preservation as it is currently serving as a riparian buffer area. Vegetated riparian buffers promote stream bank stability and filter run off generated from agricultural and construction activities, thus increasing water quality. Furthermore these areas provide excellent wildlife habitat for a variety of native species" (*Forest Management Plan and Cover Type Map, Cover Type 2 text, p. 10*).

The recommendations of the applicant's Forest Management Plan closely mirror County policies, which encourage the preservation of existing vegetation and wildlife habitat on developing properties (*Revised General Plan, Chapter 5, Forests, Trees, and Vegetation Policies, Forest, Trees, and Vegetation Policy 10*).

The applicant has depicted a 50-foot wide "Tree Preservation Area" along the exterior boundary of the larger Stonewall Business Park, consisting primarily of Cover Types 3 (early successional forest containing immature Eastern red cedar and Virginia pine) and 4 (Virginia pine), which are both low priorities for preservation (*Forest Management Plan and Cover Type Map, Cover Type 3 & 4 text, p. 10*). While these areas are low priorities for preservation, some of the vegetation within these areas may be able to fulfill buffer requirements. Regarding Cover Type 3, the Forest Management Plan states that "[t]here are, however, numerous [E]astern red cedar saplings and smaller trees up to 6" DBH [diameter at breast height] within this Cover Type that may be considered for transplanting for use as visual buffers or in landscaped settings" (*Forest Management Plan and Cover Type Map, Cover Type 3 text, p. 10*). Regarding Cover Type 4, the Forest Management Plan states, "[a]s the preservation of Virginia pine is not a priority, many of these trees may be removed. This will allow for the release of more desirable hardwood species that are present in the understory such as oak and hickory. The removal of Virginia pine will also improve safety" (*Forest Management Plan and Cover Type Map, Cover Type 4 text, p. 10*).

The siting of the proposed power plant would impact high-quality vegetation, including Cover Types 1 and 2 (upland hardwoods and bottomland hardwoods, respectively). The plat does not address impacts to these resources or anticipated mitigation measures.



Forest Resources

Staff recommends that the application be revised in order to preserve as much of the high-quality existing vegetation as possible and incorporate it into the development, with particular attention to Cover Types 1 and 2 (upland hardwoods and bottomland hardwoods, respectively). Such a strategy could help meet the open space policies of the Transition Policy Area, maintain the site's forests and natural vegetation, improve its aesthetic values, and protect existing riparian buffers. For these reasons, the application should commit to additional tree save areas. Particular attention should be given to preserving and maintaining the existing forest cover adjacent to Sycolin Creek, the transmission lines, and the Dulles Greenway, the avoidance of impacts to steep slopes, and limitations on the clearing of moderately steep slopes, with the exception of unavoidable clearing due to road or utility line construction.

For Cover Types 3 and 4 (early successional forest and Virginia pine, respectively), staff recommends that the applicant commit to the best management practices contained within the Forest Management Plan including the transplanting of desirable species and the removal of Virginia pine. If supplemented with suitable hardwood species, these areas could serve as effective buffers. However, in their current state, these areas should not be proposed as tree save areas.

Staff further recommends a commitment to a long-term maintenance plan and forestry best management practices, including the removal of invasive species.

Steep and Moderately Steep Slopes

The hazards associated with the disturbance of steep and moderately steep slopes include erosion, building and/or road failure, and downstream flooding. For these reasons, County policies call for a prohibition of land disturbance on slopes with a grade of more than 25 percent and special performance standards to protect slopes with grades from 15 to 25 percent. Performance standards include best management practices, locational clearances for clearing and grading, and avoidance of natural drainageways (*Revised General Plan, Chapter 5, Steep Slope and Moderately Steep Slope Policies, Steep Slope and Moderately Steep Slope Policies 1 & 3*). Such consideration gives the County some assurance that steep and moderately steep slopes and their associated resources, such as surface waters, forests, and wetlands, will be protected.

The project area features several steep and moderately steep slope areas, which are depicted on the plat. The siting of the proposed power plant would impact steep and moderately steep slopes. The plat does not address impacts to these resources or anticipated mitigation measures.

Staff recommends the applicant revise the application and submit a design that respects the integrity of steep and moderately steep areas. If the applicant intends to intrude into any moderately steep areas the applicant should explain what special performance standards or treatments are proposed for those areas. The applicant should avoid disturbance of steep slopes.

Plant and Wildlife Habitats

The County promotes the protection of the County's vegetative and wildlife resources and the creation of wildlife habitats by encouraging the incorporation of indigenous vegetation into the landscape design of new development and encouraging a compact, concentrated development pattern (*Revised General Plan, Chapter 5, Plant and Wildlife Habitats Policies, Plant and Wildlife Habitats Policy 7*). Plan policies state that development applications with the likelihood of impacting one or more natural heritage resources will conduct a species assessment and develop a plan for impact avoidance if the presence of a natural heritage resource is identified. The Virginia Department of Conservation and Recreation (DCR), Division of Natural Heritage (DNH) defines natural heritage resources to include rare, threatened, and endangered plant and animal species; exemplary natural communities, habitats, and ecosystems; and significant geologic formations (*Revised General Plan, Chapter 5, Plant and Wildlife Habitats Policies, Plant and Wildlife Habitats Policy 8*).

The related rezoning application for the Stonewall Secure Business Park (ZMAP 2008-0017, et alia) contains an Endangered and Threatened Species Habitat Evaluation and Rare Plant Species/Community Assessment. The assessment identified the following natural heritage resources within the study area, which included the Stonewall site:

- A rare plant community (Northern Hardpan Basic Oak-Hickory Forest) in two locations on the eastern and southeastern portion of the study area. The exact location of these resources was not described in the study and is not annotated on the plat;
- Suitable habitat for and the documented presence of the wood turtle (*Glyptemys insculpta*), a state-threatened species, along Sycolin Creek;
- Potential foraging habitat for two state-threatened bird species (the loggerhead shrike and Henslow's sparrow); and,
- Hairy beardtongue (*Penstemon hirsutus*), a state-rare plant associated with soils derived from diabase rock, on the northern portion of the power line easement in the central portion of the site (*Endangered and Threatened Species Habitat Evaluation and Rare Plant Species/Community Assessment, Wetland Studies and Solutions, Inc., November 8, 2004*).

Because the presence of the state-listed wood turtle has been documented on the site, the applicant's wetlands consultant recommended various implementation measures, to include:

- A winter-time (December through mid-March) search to document if wood turtles hibernate within the portion of Sycolin Creek located on the project site;
- Locating any in-stream work (such as road and utility crossings) in areas that do not provide high-quality hibernation habitats;
- Placement of a time-of-year restriction on all in-stream work to avoid impacts to hibernating turtles;
- Implementation of strict adherence to erosion and sediment control measures;
- Use of bridge spans, bottomless culverts, or culverts countersunk at least six inches below the streambed to prevent barriers to the migration of aquatic organisms and allow them to pass through the culvert;
- Searches for individual wood turtles within the limits of clearing before the initiation of any construction in areas of suitable habitat and the relocation of any wood turtles found during the search; and,
- Provision of educational materials to contractors working in areas of potential wood turtle habitat to make them aware of the possibility of wood turtles on the site and to familiarize them with the species' appearance, status, and life history (*Memorandum, Wetland Studies and Solutions, Inc., September 22, 2006*).

For a previous larger rezoning application (ZMAP 2005-0028, Creekside), which included all of the Stonewall site and other lands, the Department of Conservation and

Recreation (DCR) reviewed the project (dated January 18, 2006) and recommended that the application preserve the Northern Hardpan Basic Oak-Hickory significant communities. DCR also recommended that the applicant conduct additional surveys of suitable habitat for rare diabase species in June 2006 and coordinate with the Virginia Game and Inland Fisheries (VDGIF) and the U. S. Fish and Wildlife Service (USFWS) regarding compliance with protected species legislation. Because the previous habitat survey covered a larger area than the current application, the location of the Northern Hardpan Basic Oak-Hickory community is unclear.

The siting of the proposed power plant would impact plant and wildlife habitats. The plat does not address impacts to these resources or anticipated mitigation measures.

Staff recommends that the applicant verify the location of the Northern Hardpan Basic Oak-Hickory community. The applicant should also verify whether additional surveys of suitable habitat for rare diabase species were conducted, as recommended by DCR, and coordinate with the VDGIF and the USFWS regarding compliance with protected species legislation. Staff recommends that the Northern Hardpan Basic Oak-Hickory community be preserved, that the applicant identify the community on the plat, and that applicant specify and commit to protection measures. Staff also recommends that the applicant preserve and buffer suitable habitat for the wood turtle, the loggerhead shrike, Henslow's sparrow, and the hairy beardtongue. The applicant should commit to implementation measures recommended by the applicant's consultant for the wood turtle. The applicant should also incorporate indigenous vegetation into the landscape design and utilize a compact, concentrated development pattern.

Historic Resources

The Revised General Plan states the County will require an archaeological and historic resources survey as part of all development applications (Revised General Plan, Chapter 5, Historic and Archaeological Resources Policies, Historic and Archaeological Resources Policy 11). The County will protect structures and other features of historic significance in the context of their natural settings and will work with landowners to convey the historic value of the resource to the community at large. Structures and other features of particular historical significance will be retained, restored, or utilized in adaptive reuse (Revised General Plan, Chapter 5, Historic and Archaeological Resources Policies, Historic and Archaeological Resources Policy 8).

The related rezoning application for the Stonewall Secure Business Park (ZMAP 2008-0017, et alia) includes a Phase 1 archaeological survey for the subject property. The plat identifies areas of identified archaeological and historic resources within the limits of

the proposed Special Exception. Staff's review of the submitted report will be sent under separate cover.

SITE DESIGN

Open Spaces

Within the Transition Policy Area, the Plan envisions that natural open spaces will be the predominant visual feature of the landscape and an enhancement to the area's river and stream corridors (*Revised General Plan, Chapter 8, General Policies, General Policy 2*). All development within the Transition Policy Area will be clustered with 50 to 70 percent open space and the full implementation of the Green Infrastructure policies (*Revised General Plan, Chapter 8, Land Use Pattern, text*). The County envisions that the Lower Sycolin subarea will have a more rural character with lower densities and higher open space requirements than other subareas to facilitate a transition to the Rural Policy Area (*Revised General Plan, Chapter 8, Lower Sycolin and Middle Goose Subareas, text*). Within the Lower Sycolin subarea, at least 70 percent of the site will be maintained as open space (*Revised General Plan, Chapter 8, Community Design Policies, Community Design Policy 2*). Open space areas will serve as a transition between the private and public realm. Open spaces will also form a contiguous network, integrated with pedestrian trails, both within the development and, where feasible, with neighboring properties (*Revised General Plan, Transition Policy Area Design Guidelines, Transition Policy Area Design Guideline 3d*).

The applicant's proposed open space system appears to consist of a 50-foot perimeter buffer and the floodplain along the northern border of the site (see previous River and Stream Corridor Resources section). No areas are formally designated as open space. County policies anticipate 70 percent of the site area as open space.

To ensure compatibility and meet the intent of the Transition Policy Area as a visual and spatial transition from the Suburban Policy Area to the Rural Policy Area, County policies anticipate a contiguous open space system incorporating environmentally sensitive features, culturally significant sites, and other Green Infrastructure elements that form a contiguous network, incorporate pedestrian trails, and enhance the area's river and stream corridors. Perimeter buffers, unless designed in conjunction with Green Infrastructure elements, do not generally satisfy open space needs. The current application does not contain enough information to evaluate whether the open space elements will be protected, connected, incorporate environmentally sensitive features, or help to buffer neighboring residential uses. Additionally, if the site were to develop as a power plant within a secure business park, the application does not address security measures and implications for open space, trails, and connectivity and views from adjacent properties.

The proposed area and quality of open spaces do not adequately fulfill the intent of County policies. Staff recommends that the applicant develop a contiguous open space system comprising 70 percent of the site area, encompassing and enhancing significant elements of the Green Infrastructure, and forming the predominant visual feature of the landscape. Priority should be given to natural areas along Sycolin Creek, drainageways, wetlands, steep slopes, moderately steep slopes, forest resources, stream corridors, and other natural areas to protect drinking water resources, along with historic and archaeological resources (see previous Green Infrastructure discussion). Open spaces should be designed to mitigate views from public rights-of-way and buffer neighboring residential properties. Open spaces should connect with those of the larger business park.

Stormwater Management

The project's proposed impervious surfaces, including parking lots and rooftops, are anticipated sources of runoff and pollutants, such as litter, road salts, oil, grease, and heavy metals, which impact water quality (Revised General Plan, Chapter 5, Surface and Groundwater Resources, text). Grass and landscape areas can also be expected to have substances, such as fertilizers, pesticides, and herbicides, applied to them each year. Increased storm runoff volumes and velocities are also expected, which could scour adjacent drainageways and impact wetland resources, adjacent properties, and wildlife habitat.

To protect water resources and the integrity of neighboring properties, the Revised General Plan calls for low impact development (LID) techniques, which integrate hydrologically functional designs with methods for preventing pollution (Revised General Plan, Chapter 5, Surface Water Policies, Surface Water Policy 2). LID approaches seek to control runoff discharge, volume, frequency, and quality in order to mimic predevelopment runoff conditions through a variety of small-scale site design techniques. LID techniques can help reduce sedimentation and erosion, trap and remove pollutants such as nitrogen, phosphorus, metals, and organic compounds, protect wildlife habitat, store flood waters, and maintain the overall water quality of nearby streams. LID facilities should be located as close as possible to impervious areas and utilize the landscape and soils to naturally move, store, and filter run-off. The associated flow reductions and water quality improvements can then benefit the receiving streams. LID techniques include:

- Permeable paving;
- Porous concrete;
- Native landscaping enhanced through the routing of runoff through these areas;
- Rain gardens;
- Native-vegetated drainage swales for the movement and temporary storage of runoff;

- Vegetated filter strips that slow runoff speed, trap sediment and pollutants, and provide additional water absorption;
- The collection and use of rooftop runoff for irrigation; and,
- Green roofs.

The application does not include information regarding Low Impact Development methodologies.

Given that the property is adjacent to Sycolin Creek, staff recommends that the applicant demonstrate that the most efficient pollutant removal BMPs will be used, that existing drainage patterns and hydrology to wetlands will be maintained, and that low impact development (LID) techniques such as bioretention and sheet flow to vegetated buffer areas will be implemented. Staff recommends stormwater treatment measures that mimic the pre-development conditions of the site, mitigate impacts to the watershed, and treat the stormwater runoff as an amenity visible to employees. The applicant should consider various site measures, such as permeable pavers, porous concrete, cisterns, planted swales, curb cuts, rain gardens, and bioretention filters adjacent to impervious areas, to promote infiltration on-site, minimize peak storm flows, and help filter non-point source pollutants. Pipe installation should be minimized.

Quarry Compatibility

Properties to the east of the site have been proposed as future quarry expansion areas for the Luck Stone Quarry (ZMAP 2009-0003, Luck Stone Quarry). One of the parcels has also been proposed for a co-located water treatment plant (ZMAP 2009-0004, Loudoun Water and Luck Stone Quarry). Expansion of the Luck Stone quarry into several nearby parcels was most recently approved in 1991 and 2001 (SPEX 1990-0019, Luck Stone Corporation and ZMAP 1999-0004 & SPEX 1999-0006, Luck Stone Leesburg Plant).

The Plan recognizes that crushed-stone quarries that extract diabase are a substantial economic resource in the County (Revised General Plan, Chapter 5, Mineral Resource Extraction Areas, text). The Plan states that the Luck Stone Quarry will be protected from incompatible uses by ensuring that encroaching new development will not hinder the quarry operation (Revised General Plan, Chapter 8, Community Design Policies, Community Design Policy 26). For instance, the County will encourage buffers and compatible uses on adjacent tracts as well as adequate transportation routes (Revised General Plan, Chapter 5, Mineral Resource Extraction Areas, text).

The County uses a Quarry Notification Overlay District to protect quarries and the extractive industry, which extends 3,000 feet from any existing quarry (Revised General Plan, Chapter 8, General Policies, General Policy 7). The Special Exception area is

located within the quarry overlay district. Disclosure is the primary means to inform adjacent property owners of the presence of extractive operations and to ensure compatibility between uses. Effects from blasting and other extractive operations could include noise, vibration, fugitive dust, exhaust fumes, and slow-moving heavy truck traffic.

Staff recommends that the applicant explore the scope and the scale of existing and future quarry operations to ensure that the proposed power plant is compatible with these operations, including blasting and the associated air and ground vibration.

Streetscape & Land Use Arrangement

Major arterials and collector roads servicing non-residential uses will be designed to merge as far as possible with the natural landscape and not develop as the dominant feature of the landscape. These roads will develop as boulevards, with sufficient landscaping and tree plantings on either side (Revised General Plan, Chapter 11, Transition Policy Area Design Guidelines, Design Guideline 3c). Non-residential uses will also front these major arterial or collector roads (Revised General Plan, Chapter 11, Transition Policy Area Design Guidelines, Design Guideline 3c).

With the exception of a potential emergency access connection from Gant Lane, the power plant does not have access to a public right-of-way. The applicant proposes two access points onto Sycolin Road for the larger Stonewall Business Park and a rudimentary internal road network that connects in two places to the Special Exception area. The ultimate location and condition of the roads surrounding the larger Stonewall Business Park are not depicted on the plat. The applicant has not explained how the proposed power plant would access Sycolin Road if the Business Park is not approved and developed prior to the development of the power plant.

Staff recommends that the applicant provide further information regarding access to the proposed power plant from Sycolin Road, including the disposition of roads within the Stonewall Business Park and external roadways.

Building Scale & Form

Non-residential uses will be developed at a scale that allows them to blend effectively (visually and spatially) into a rural landscape (Revised General Plan, Chapter 11, Transition Policy Area Design Guidelines, Design Guideline 3a). Within the Transition Policy Area, individual buildings of non-residential development along collector roads will not be greater than 40 feet in height and 150 feet in length. Building heights will relate to the surrounding landscape and heights of adjacent structures. Building heights can be stepped to relate to adjoining structures (Revised General Plan, Chapter 11, Transition Policy Area Design Guidelines, Design Guideline 3b).

The scale and the volume of the primary built mass and accessory elements should not dominate over the natural landscape. Buildings should be shielded from the road using such items as natural landscaping and earthen berms. Developments will be sensitive to the use of glass and night lighting. These building elements will be buffered from access roads (Revised General Plan, Chapter 11, Transition Policy Area Design Guidelines, Design Guideline 3c). Additionally, continuous plane building surfaces will be avoided. Homogeneous surfaces shall not exceed a linear distance of 20 feet especially when they front public access roads, such as major arterial or collector roads. Such surfaces will be broken into smaller segments through fenestration and setbacks (Revised General Plan, Chapter 11, Transition Policy Area Design Guidelines, Design Guideline 3c).

Staff notes that the Revised General Plan encourages the incorporation of indigenous vegetation into the landscape (Revised General Plan, Chapter 5, Plant and Wildlife Habitats Policies, Plant and Wildlife Habitats Policy 7), which can help buildings to blend into the surrounding landscape. Overall, landscaped areas screen and soften views of buildings from roads, enhance the visual quality of the project, provide employees with open space, mitigate environmental effects, allow the incorporation of indigenous vegetation into the project, and provide habitat for wildlife.

The applicant has provided a plan view with possible locations for various power plant facilities. The applicant has not provided information regarding facility heights, massing, landscaping, scale, intensity of use, or design characteristics. Further, a general description and location of trees, shrubs, grasses, perennials, depressed parking areas, and/or berms to be used throughout the site would help determine whether the landscaping and buffering is adequate to help ensure compatibility with the surrounding uses and to assess the visual impact of the project. Modeled views of the proposed facilities from surrounding areas have not been provided.

Staff recommends that the applicant provide further information regarding site facilities, landscaping, scale, intensity of use, and design characteristics, to include site design and building design. Staff recommends that the applicant provide modeled views of the proposed facilities from the surrounding areas.

Staff recommends that all buildings and parking be screened and the development camouflaged behind open space with less intensity adjacent to sensitive uses, such as river and stream corridors and residences. Given the proximity of residential uses to the west of the Special Exception area, additional details are needed to determine whether the proposed use is compatible with these residences, such as plan views, cross-sections, and viewshed perspectives.

For building design, staff recommends that the applicant avoid the use of continuous plane building surfaces, wherever practicable, and break up large building segments into smaller segments through the use of fenestration and setbacks.

Noise Impacts

County policies call for accommodation of the changing technological requirements of capital-intensive technology industries, while balancing any potential harmful environmental effects on the community, such as noise (Revised General Plan, Chapter 2, Energy and Communication Policies, Energy and Communication Policy 5).

Noise-sensitive uses surrounding the project site include residences to the west, park lands to the north, and surrounding areas zoned TR-10 and JLMA-20. Staff notes that Section 5-1507 of the Zoning Ordinance contains regulations regarding noise levels. The applicant has not provided information regarding the expected noise generation of uses within the site.

Staff recommends that a noise analysis be conducted and provided to the County documenting the predicted cumulative noise impact of all on-site activities on the surrounding residential uses and other areas zoned TR-10 and JLMA-20. The applicant should provide information regarding the location, number, noise levels, testing, and expected use of facilities on the site.

Lighting & Signage

County policies call for appropriate lighting to achieve the following:

- Promote the use of lighting for convenience and safety without the nuisance associated with light pollution;
- Promote a glare-free environment through proper lighting performance standards to improve visibility and enhance public safety;
- Promote appropriate lighting standards to conserve energy; and,
- Develop appropriate lighting standards to prohibit unnecessary and intrusive light trespass that detracts from the beauty and view of the night sky (Revised General Plan, Chapter 5, Lighting and Night Sky Policies, Lighting and Night Sky Policy 1).

Additionally, signage will be scaled and designed to be compatible with the surrounding landscape (Revised General Plan, Chapter 11, Transition Policy Area Design Guidelines, Design Guideline 3c).

The applicant did not provide information regarding lighting or signage. Lighting and signage are especially important given the project's proximity to residences and the character of the area as a low-density part of the Transition Policy Area. Staff

anticipates that a utility plant would incorporate lighting to meet Occupational Safety and Health Administration (OSHA) requirements for smokestacks, catwalks, heat recovery units, turbines, and all buildings. Staff also notes that directional and interpretive signage within the site could alert people to the presence of sensitive natural features and historical resources.

Staff recommends that the applicant commit to lighting that is fully shielded, provides a glare-free environment, is confined to the site, and is turned off after business hours, unless required for safety or security purposes, and that illumination levels will be no greater than necessary for a light's intended purpose. All lighting should be mounted as low as practicable and designed to preclude light trespass onto adjoining properties, glare to passersby, skyglow, and deterioration of the nighttime environment. Staff recommends that the applicant provide information regarding the lighting to be used for smokestacks, catwalks, heat recovery units, turbines, and all buildings.

COMMISSION PERMIT

The County will determine the need for new public facilities and will identify suitable sites based on the Revised General Plan, appropriate area plans, land use, and growth policies (Revised General Plan, Chapter 3, General Public Facilities Policies, General Public Facilities Policy 2).

In accordance with the Revised 1993 Zoning Ordinance, a Commission Permit is required when a public utility or public service facility is constructed to determine if the general location, character, and extent of the proposed use are in substantial accord with the Comprehensive Plan.

Staff is unable to provide a recommendation for the Commission Permit until the other issues are resolved. Staff recommends that these issues be satisfactorily resolved so that staff can access whether the general location, character, and extent of the proposed use is in substantial accord with the Comprehensive Plan.

RECOMMENDATION

The application proposes a use unanticipated within the Lower Sycolin subarea. The applicant has not offered sufficient information to effectively assess the proposal and its impact on site resources and surrounding uses or explained why other locations in the County are unsuitable.

Staff recommends that the applicant demonstrate how the application will effect a visual and spatial transition between the Suburban and Rural Policy Areas and how the proposal is appropriate for the Lower Sycolin subarea of the Transition Policy Area with particular attention to air quality and elements of the Green Infrastructure. As a minimum, staff would expect the applicant to provide elevations, sections, building

envelopes, annotate internal resource protection areas on the plat, and describe how the design and intensity of the development effect a visual and spatial transition between the Suburban and Rural Policy Areas. Illustratives depicting facilities, buildings, and landscape details should also be provided and the application should address the relationship of the proposed uses to the nearby residences.

With regards to elements of the Green Infrastructure, staff is particularly concerned with air quality, the impact on Sycolin Creek, historic and archaeological resources, forest resources, steep slopes, moderately steep slopes, wildlife habitat, and wetlands. Some of these environmental issues could be addressed if 70 percent of the site were retained as open space, as recommended in County policies.

Staff also recommends that the applicant combine the current application with the associated Stonewall Secure Business Park (ZMAP 2008-0017, et alia).

Staff is available to meet with the applicant to discuss these issues.

cc: Julie Pastor, AICP, Planning Director
Cynthia Keegan, AICP, Program Manager (via email)

Attachment 1
Air Quality
Hybrid Energy Park at Stonewall Secure Business Park

The Clean Air Act was passed in 1970 to protect the public's health and welfare. The legislation authorized the development of comprehensive federal and state regulations to limit emissions from both stationary (industrial) and mobile sources. Four major regulatory programs affecting stationary sources were initiated: the National Ambient Air Quality Standards (NAAQS), State Implementation Plans (SIPs), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPs). Major amendments were added to the Clean Air Act in 1977 and 1990. The 1977 Amendments primarily concerned provisions for the Prevention of Significant Deterioration of air quality. The 1990 amendments established requirements for areas not meeting the NAAQS. These amendments established a process for evaluating air quality in each region and identifying and classifying nonattainment areas according to the severity of the air pollution problem. The Clean Air Act sets health standards for six ambient pollutants: carbon monoxide, sulfur dioxide, nitrogen oxides, ozone, lead, and particulate matter. The U.S. Environmental Protection Agency (EPA) establishes rules and regulations to implement the Clean Air Act (*Metropolitan Washington Council of Governments (MWWCOG), State Implementation Plan for Fine Particulate Standards, March 7, 2008; USEPA, www.epa.gov, History of the Clean Air Act*).

The metropolitan Washington region, which includes Loudoun County, is a nonattainment area for two of the six pollutants: ground-level ozone and particulate matter (less than 2.5 microns: PM_{2.5}). The EPA designated the metropolitan Washington region as moderate nonattainment for ground-level ozone in April 2004 and as a nonattainment area for PM_{2.5} in January 2005 (*MWWCOG, State Implementation Plan for 8-Hour Ozone Standard, May 23, 2007; State Implementation Plan for Fine Particulate Standards, March 7, 2008*).

PM_{2.5} matter consists of tiny airborne particles that result from particulate emissions; condensation of sulfates, nitrates, and organics from the gas phase; and coagulation of smaller particles. The size of the particles is directly linked to their potential for causing health problems. Fine particles less than 2.5 microns in diameter pose the greatest problems because they can lodge deep in the lungs and some may get into the bloodstream. Exposure to such particles can affect both lungs and heart. PM_{2.5} pollution affects both human health and the environment, including crops and vegetation. Particulate pollution exposure is linked to a variety of health problems, including increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; decreased lung function; aggravated asthma; development of chronic bronchitis; irregular heartbeat; non-fatal heart attacks; and premature death in people with heart or lung disease (*MWWCOG, State Implementation Plan for Fine Particulate Standards, March 7, 2008*). Fine particle pollution can be emitted directly or formed secondarily in the atmosphere. Secondary particulates include sulfates formed from sulfur

dioxide emissions from power plants and industrial facilities. Nitrates, another type of fine particle, are formed from emissions of nitrogen oxides from power plants, automobiles, and other combustion sources (*USEPA, www.epa.gov*).

Ground-level ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form in harmful concentrations in the air. Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level ozone can also reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. Ground-level ozone also damages vegetation and ecosystems. In the United States alone, ozone is responsible for an estimated \$500 million in reduced crop production each year (*USEPA, www.epa.gov*).

Part C of the 1977 Amendments stipulates requirements to prevent significant deterioration of air quality and, in particular, to preserve air quality in national parks, wilderness areas, monuments, and seashores. The Amendments establish Class I, II, and III areas, where emissions of particulate matter and sulfur dioxide are to be restricted. The restrictions are most severe in Class I areas (*USEPA, www.epa.gov, Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service*). Federal land managers are charged with the direct responsibility to protect the air quality and related values (including visibility) of Class I lands and to consider, in consultation with the EPA, whether proposed industrial facilities will have an adverse impact on these values (42 USC 7475(c)). Federal lands potentially impacted by the proposed power plant include Shenandoah National Park and national forests (to include Monongahela National Forest, George Washington National Forest, and Jefferson National Forest).

On behalf of the State Air Pollution Control Board, the Air Quality Division of the Virginia Department of Environmental Quality (DEQ) is responsible for carrying out the mandates of the Virginia Air Pollution Control Law, as well as meeting Virginia's federal obligations under the Clean Air Act. DEQ regulates the emission of air pollutants from industries and facilities by issuing and ensuring compliance with permits that set limits that are protective of public health (*Virginia Department of Environmental Quality, www.deq.state.va.us*).

The Virginia Department of Environmental Quality is responsible for issuing several types of air and water permits for the construction and operation of power plants. In some cases, the permit requirements include computer analysis, or modeling, of air quality to help determine how emissions may affect the environment.

Pollutants are emitted by these plants when natural gas is burned. Nitrogen oxides are emitted in the largest amounts. Other pollutants emitted, but in lesser amounts, include carbon monoxide, particulate matter, volatile organic compounds, and sulfur dioxide.

DEQ implements regulations that limit the amount of air emissions a plant is allowed to release. DEQ also regulates any direct water discharges that result from a new plant. DEQ is not

authorized to make decisions concerning zoning, aesthetics, the need for a power plant, or the level of noise that may be caused by the plant.

When a permit application is submitted for a plant, an air quality modeling analysis is required. This analysis determines the impact the plant will have on the air, and, thus the potential impacts on people living around the facility.

Before receiving a permit from DEQ, the plant must complete a form, signed by the local zoning authority, stating that the proposal is consistent with local zoning requirements (*DEQ, www.deq.state.va.us*).

Based on discussions with DEQ staff of the Northern Regional Office, it is County staff's understanding that the applicant should coordinate with DEQ's Northern Regional Office regarding permits for the proposed power plant. The applicant will be required to complete various air quality permit applications, including New Source Review (NSR) and Prevention of Significant Deterioration (PSD). PSD regulations ensure that there is no significant worsening of the air quality. The applicant will need to address NAAQS for particulate pollution, ground-level ozone, carbon monoxide (CO), sulfur oxides, nitrogen oxides, and lead. The applicant will also need to address formaldehyde and various greenhouse gases, including ammonia, carbon dioxide, and methane. Due to the interrelationship between the power plant and the remainder of the uses proposed for the Stonewall site, the entire site may need to undergo an air permit review. Within 12 months of starting operation of the plant, the applicant would also be required to apply for a federal operating permit, administered through DEQ. Stack testing should also be anticipated. The applicant may also need to coordinate with the land managers of the National Park Service for Shenandoah National Park and the US Forest Service to evaluate impacts to the air quality of the Park and national forests (Monongahela, George Washington, and Jefferson), respectively (*Meeting with DEQ staff, Northern Virginia Regional Office, Woodbridge, VA, May 22, 2009*).